REMARKS

Claims 1-4, 8-11, 68, 80-84 and 86-88 were pending prior to this amendment. Claims 1, 3, 4 and 80 are amended herewith. New claims 89 and 90 have been added. Support for the claim amendments and newly added claims can be found on pages 2, 3 and 14 of the specification. Claim 84 has been canceled. Claims 1-4, 8-11, 68, 80-83 and 86-90 are, therefore, currently pending with claims 1 and 4 being independent claims.

Applicant expressly reserves the right to pursue the subject matter canceled by this amendment. No new matter has been added.

Claim Objections

The Examiner has objected to claim 84 as being a substantial duplicate of claim 9. Applicant respectfully thanks the Examiner for pointing out this inadvertent duplication. Claim 84 has been canceled.

Therefore, withdrawal of this objection is respectfully requested.

Rejections Under 35 U.S.C. §101

The Examiner has rejected claims 8-11, 84 and 86 under 35 U.S.C. §101 for lacking patentable utility. The Examiner alleges that as the polynucleotides of the claims need not be any particular length and may not be sufficiently long to encode an immunogenic polypeptide, and as there are no other uses for the expression vectors disclosed in the instant application, it is not clear why one of ordinary skill in the art would make or how one of ordinary skill in the art would use an expression vector for fragments of SEQ ID NO: 1 that encode polypeptides that are not immunogenic.

Applicant respectfully traverses the rejection. Other uses are provided for producing MIVR-1 polypeptides that may not be sufficiently long to be immunogenic, such that utility for the expression vectors for fragments of SEQ ID NO: 1 that encode such polypeptides is provided. The specification provides that the complete MIVR-1 polypeptide or fragments thereof have utility in both diagnostic and therapeutic applications (See, e.g., page 2, lines 18-21 and page 16, lines 20-22). It is provided that MIVR-1 polypeptides can be used in the treatment of cardiovascular disorders (See, e.g., page 2, lines 2-10). One of ordinary skill in the art would recognize that the sizes of therapeutic MIVR-1 polypeptides, while overlapping with, are not

necessarily equal to the sizes of immunogenic MIVR-1 polypeptides. A therapeutic fragment of MIVR-1 may be of a size that is, in fact, less than the size of the shortest immunogenic MIVR-1 polypeptide fragment. Furthermore, Applicant has contemplated MIVR-1 polypeptides that are immunogenic when part of a fusion protein (See, e.g., page 16, lines 17-19 and page 22, lines 15-17). One of ordinary skill in the art would readily recognize that such polypeptides may not be sufficiently immunogenic alone but, as part of a fusion protein, can be used to generate antibodies specific to MIVR-1. Such non-immunogenic MIVR-1 polypeptides include those that are not of a size sufficient to be immunogenic.

Additionally, it would be readily appreciated by one of ordinary skill in the art that the expression vectors provided in the specification can be used for producing nucleic acids in the form of MIVR-1 RNA transcripts (See, e.g., page 20, line 10) in addition to using the expression vectors for the production of MIVR-1 polypeptides. Such MIVR-1 RNA transcripts can be used as described in the specification on pages 4 and 16-18, for example, as probes to detect MIVR-1 nucleic acid expression (i.e., mRNA expression) or as antisense oligoribonucleotides to inhibit the ultimate expression of MIVR-1 protein (See, e.g., pages 16-18). The length of such MIVR-1 nucleic acids can be of any length sufficient such that hybridization occurs and can be smaller than the lengths of MIVR-1 nucleic acids that encode the shortest immunogenic MIVR-1 polypeptides.

The Examiner is respectfully reminded that the Applicant need only make one assertion of utility for the claimed invention to satisfy the utility requirement, and in order to violate this requirement, the claimed invention must be shown to be "totally incapable of achieving a useful result." *Brooktree Corp v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1571, 24 USPQ2d 1401, 1412 (Fed. Cir. 1992). Based on the foregoing, Applicant maintains that the specification provides at least the above-mentioned credible assertions of utility for using the claimed expression vectors.

Therefore, withdrawal of this rejection is respectfully requested.

Rejections Under 35 U.S.C. §112

The Examiner has rejected claims 1-3, 8, 10, 11, 82 and 83 under 35 U.S.C. §112, first paragraph as containing subject matter which was not described in the specification in such a way as to enable one of ordinary skill in the art to use the invention. The Examiner alleges that

the application provides no direct demonstration as to the function of the protein, and therefore, one of ordinary skill in the art would not be enabled to use the protein and fragments thereof and the claimed expression vectors encoding the protein and its fragments.

Applicant respectfully traverses the rejection. Although Applicant maintains that the teachings in the specification do establish the function of the protein, Applicant maintains that one of ordinary skill in the art is enabled to use the claimed invention regardless of the protein's function. Applicant asserts that the association of MIVR-1 response to mechanical deformation in vascular smooth muscle cells (VSMCs) is sufficient to establish the use of MIVR-1 nucleic acids and polypeptides for diagnostic purposes.

The specification provides, in the **Examples,** that MIVR-1 is upregulated when vascular smooth muscle cells are mechanically deformed. This *in vitro* method of placing cells under strain is recognized by those of ordinary skill in the art to simulate *in vivo* cardiac strain. The specification also provides that MIVR-1 nucleic acids and polypeptides, including fragments of the complete MIVR-1 nucleic acid or polypeptide, can be used for a variety of diagnostic purposes (See, e.g., pages 2-9). Therefore, one of ordinary skill in the art would reasonably conclude that proteins found to be upregulated in VSMCs that are mechanically deformed *in vitro* are indicative of *in vivo* cardiac strain and /or resulting pathologic conditions. Therefore, based on the data and guidance provided in the specification, one of ordinary skill in the art is enabled to use the nucleic acids of the claims at least as diagnostic probes, and it follows that one of ordinary skill in the art is also enabled to use the claimed expression vectors.

Accordingly, withdrawal of this rejection is respectfully requested.

The Examiner has also rejected claims 1, 3, 4, 68, 80, 81, 87 and 88 under 35 U.S.C. §112, first paragraph, for failing to comply with the enablement requirement. The Examiner seems to extend his argument for the above-described rejection by alleging that as the specification does not provide evidence as to the function of the protein or demonstrate that the protein is actually down- or up-regulated for any disorder, one of ordinary skill in the art would not know how or for what to use the claimed fragments as probes.

Applicant respectfully traverses the Examiner's rejection on the basis of the arguments provided above. Applicant agrees that the claims read on nucleic acid probes as well as nucleic acid sequences encoding polypeptides, both of which can be used for diagnostic purposes.

Applicant, however, disagrees with the Examiner's assertion that a sufficient demonstration that the protein is actually down- or up-regulated such that one of ordinary skill in the art would know how to use the claimed invention has not been provided.

As argued above, the specification has clearly established that MIVR-1 is upregulated in VSMCs when mechanically deformed. Proteins that are upregulated during this process lend themselves to serve at least as targets in diagnostic methods for detecting cardiac strain and/or pathologic conditions *in vivo.* Therefore, based on these teachings alone, sufficient direction is provided in the specification such that one of ordinary skill in the art would know how to use the claimed nucleic acids, e.g., as nucleic acid probes or for producing MIVR-1 polypeptides to which antibodies can be generated.

Additionally, the Examiner has provided no evidence to sufficiently establish that the Applicant's assertions are not credible. The Examiner has asserted no evidence that demonstrates that one of ordinary skill in the art would not be able to use the claimed nucleic acids for at least the above-recited diagnostic purposes. Therefore, based on the teachings provided in the specification, one of ordinary skill in the art is sufficiently enabled to use the claimed invention.

Accordingly, withdrawal of this rejection is respectfully requested.

Rejections Under 35 U.S.C. §102

The Examiner has rejected claims 1, 4, 68 and 88 under 35 U.S.C. §102(e) as being anticipated by Zhong et al. (U.S. Publication 20020064771). The Examiner alleges that Zhong et al. teach a sequence that is complementary to bases 56-76 of SEQ ID NO: 1.

The Examiner has also rejected claims 1, 4, 68, 80 and 88 under 35 U.S.C. §102(e) as being anticipated by Matson et al. (U.S. Patent 5,981,185) or Weiner et al. (U.S. Publication 20030026801). The Examiner alleges that Matson et al. provide a fragment of SEQ ID NO: 1 or complements thereto. The Examiner also alleges that Weiner et al. teach a nucleic acid with a sequence that consists of bases 56-75 of SEQ ID NO: 1.

Without conceding the correctness of the Examiner's assertions, Applicant has amended claim 1. The rejection, therefore, is now moot.

Accordingly, withdrawal of this rejection is respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's representative at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
Lee et al., Applicant

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